A Palliative for Wandering Attention

by Devon Edrington

I. The Ailment

Experienced teachers know that the chief impediment to learning is inattention. The most influential thinker in American Psychology, William James, put it succinctly:

> The faculty of voluntarily bringing back a wandering attention over and over again is the very root of judgment, character, and will. No one is *compos sui* if he have it not. An education which should improve this faculty would be the education par excellence.[1]

Wandering attention afflicts young and old, rich and poor, bright and dull. It is the bane of education. Acknowledging the gravity of the problem, educators have proposed many solutions, most of them being either humane variations on the farmer-club-mule theme or thinly disguised bribes. But not all efforts to help people focus attention are crude. Now that the blatant smugness with which we brushed aside ancient wisdom has become obvious to all but the most myopic, we are beginning to see that some ancient techniques (both Eastern and Western) for training attention do work. However, they require a large measure of patience, persistence, dedication, and above all, humility. Thus they are quite unsuitable for the well-adjusted Westerner who virtuously panders to an insatiable ego. The classic cures are simply too demanding for people who are so important that they claim an inalienable right to an instant fix.

Research into the nature of human consciousness during the last half-century has yielded remarkable insights which both confirm and amplify much traditional wisdom[2]. That educators have largely ignored the pedagogical significance of these recent advances in consciousness and brain research is scandalous[3]. Brendan O'Regan, of the Institute of Noetic Sciences, puts it less bluntly in an article entitled "The Puzzle of Untapped Potentials":

> How often do we read that we are using only some small fraction of our potential? In texts from the various disciplines studying some aspect or another of the human mind, we find virtually complete agreement with the notion that we all sell ourselves short by using only a minute portion of our capacities.
>
> Many would admit that perhaps someday we will know how to educate people more completely, but for the present we must "make do" with what we have and are sure of as "tried and true". Most people tend to assume that the information required for this more complete and effective kind of education doesn't exist, and that is why we are not seeing it applied. Well, we couldn't agree less! Over the past couple of decades, in a wide variety of fields, numerous techniques and methods have been quietly devised, applied, and tested -- techniques that at the very least promise to give the population at large significantly increased access to their own potentials and capacities. The puzzle remains: Why are we not applying these

> techniques more extensively, and how does it happen that mainstream educational institutions have largely ignored even the most conservative pieces of information regarding these matters?*

Why indeed? We ignore things not only because they seem valueless; we also ignore things because we see them as a threat.

> We fear our highest possibilities (as well as our lowest ones). We are generally afraid to become that which we can glimpse in our most perfect moments, under conditions of greatest courage. We enjoy and even thrill to the godlike possibilities we see in ourselves in such peak moments. And yet we simultaneously shiver with weakness, awe, and fear before these very same possibilities.[5]

Courage is the power to let go of the familiar, and we are not over-endowed with courage. Educators are no less prone than others to cling tenaciously to the safe, the established, the accepted. After all, if I innovate, I draw attention to my actions and will be held responsible for them. But if I stick to the tried and true, it is not I who bears responsibility -- responsibility falls upon the established method, so no one is responsible. How comforting! How easy! How irresponsible!

Sages from all of humanity's major traditions have for millennia agreed that the typical, well-adjusted, sane member of any society lives in a trance:

> So habitual is the trance of ordinary life that one could say that human beings are a race that sleeps and awakens, but does not awaken fully. Because half-awake is sufficient for the tasks we customarily do, few of us are aware of the dysfunction of our condition.[6]

People seem to awaken fully only as the result of some great trauma[7]. Many thinkers have viewed birth as a trauma which awakens us from the trance of intrauterine life, followed by years of accommodating (adjusting, maturing, developing, growing up) to a new trance state, consensus reality. Those who are successful at accommodating -- the well-adjusted -- do not suffer another trauma until death, whereupon they are faced with accommodating to yet another reality, etc. From whatever reality we happen to occupy, the previous one seems dream-like[8], if we can recall it at all.

A long-range view of the history of humanity reveals that every major tradition has included the view that the quality of human life is a function of the kind of consciousness which characterizes the individual. In most traditions the notion that I am responsible for the quality of my consciousness has been a minority view -- it is far more comforting to blame my condition on the Devil, or the Republicans, or the Jews, or the Blacks, or Human Nature, or . . . . We are fortunate to live in an era when the state religion of Western culture (popular science, or Scientism) is beginning to acknowledge individual responsibility for the quality of consciousness. Our best scientific minds now agree with the sages of antiquity that voluntary control of consciousness is

possible -- that we are not simply innocent victims of Fate. Roger Walsh, a noted psychiatrist, has summarized this ancient view which is now re-emerging in the West:

1. The source of all pleasure and suffering is the mind.
2. The untrained mind is vastly less under our voluntary control than we imagine. In fact, it is so out of control that we do not recognize that it is out of control.
3. Because the mind is out of control, our awareness is constricted and distorted to the extent that we are unaware of our true nature, identity, and potential, and are unaware that we are unaware. From this ignorance comes all the ultimately self-defeating behaviors that result in suffering.
4. It is possible to bring the mind under greater voluntary control, ;and thereby to reduce suffering, and discover our true nature and identity.
5. The consciousness disciplines provide guidelines for training the mind and bringing it under greater voluntary control.
6. Bringing the mind under greater voluntary control may be the optimal means for enhancing our well-being and for enabling us to contribute effectively to the well-being of others.[9]

In retrospect it is easy to see that the type of consciousness appropriate in feudal Europe was dysfunctional after the industrial revolution. No great insight is needed to see that the type of consciousness befitting industrialized society will not work in the post-industrial era into which we are rapidly moving. The industrial pedagogical paradigm emphasizing content, the acquisition of a body of correct information, learning as a product, learning as lockstep progress in a rigidly established structure, conformity, acquiescence to a fixed body of truths, convergent thinking, etc., must yield to a post-industrial paradigm (yet in the making) emphasizing creativity (rather than mere invention), how to learn, learning as a process, dissent, candor, autonomy, seeing oneself as an instrument of change (rather than as a victim), divergent thinking, holistic thinking, greater reliance upon intuition, and the recognition that education is a lifelong process, to mention a few of its more important characteristics.[10]

Voluntary control of attention is fundamental to the free (uncorked) development of the types of consciousness best suited to a rapidly (and often unpredictably) changing milieu. Attentional spasticity (the antithesis of voluntary control) is an ailment which has survived changing social structures for millennia; it either paralyzes attention, yielding the rigidly narrow focus of bigotry, or results in desultory spasms. The classic cure has always been within the reach of only a minuscule proportion of any populace. It seems highly unlikely that there will be a dramatic change in this regard within the foreseeable future. When a malady resists cure, we resort to palliatives.

II. The Palliatives

How does one set about altering students' consciousness?[11] Surely no argument is needed to establish that it is rarely accomplished by fiat, divine or otherwise. Demanding that humans develop a different sort of consciousness is like ordering them to love. They may comply overtly, but only the superficial among us would confuse loving behavior with love. To believe that there is a one-to-one correspondence between a human's performance and his/her state of

consciousness requires an extreme degree of naiveté. That such naiveté is not unusual is painfully evident in educational circles, where training is so often identified with education.

Socrates is revered as one of the world's great teachers not because he had each day's activities carefully set forth in lesson plans, nor because he followed prescriptions learned in a teaching methods course, nor because he had answers. Scavengers, intent upon finding the secret ingredient responsible for the successes of great teachers, poke around in the didactic effluvium until they find a likely morsel, subject it to statistical analysis, then triumphantly announce a high correlation between the "secret" characteristic and successful teaching. Their disciples, swooping in for the kill, hastily confuse statistical correlation with causation and declare that use of the secret ingredient will cure education's ills. If circumstances contrive to produce a wave of enthusiasm for the new recipe, then good results ensue -- for a while. But note that as enthusiasm wanes, positive results wane! After a few years the recipe is consigned to archives.

Is it not time that we learned something from this pattern? Perhaps we are looking in the wrong place for the key to pedagogical success. Looking where the light happens to be best may be an approach worthy of the drunken man in the famous Sufi tale[12], but sober educators ought to have learned from half a century of simplistic errors by behaviorists. The presupposition that technique can solve all of our problems involves a posture most unbecoming to anyone posing as an educator, and is, furthermore, passé, being a crude form of materialistic mechanism, out of favor now for almost a century in physics and for two decades in psychology (but the schools are nearly as slow to reflect such changes as is the general public).

Perhaps the most enduring and pervasive principle in education is that students learn by emulation. Socrates induced a fundamental alteration in his students by serving as a model of inquiry unfettered by the popular prejudices of his time. Children, confronted with teachers who know all of the answers (i.e., who are not themselves learners), who insist that there is only one correct way, who are unimaginative, whose sole criterion of worth is performance, etc., can learn to be creative, open, self-reliant, responsible learners only by default, that is, by not being "good" students in their *teachers'* eyes. But encouraging students to defy their teachers would be throwing out the baby with the bath water. If the bath water needs changing, then change it while exercising care to preserve the baby. It is the teachers' consciousness which needs "cleansing" so that students come forth from the educational bath with that fresh set of principles, insights, skills, and knowledge necessary for the kind of world which the *students* will inhabit.

But setting out to change teachers' consciousness is a perilous venture, so the prudent persist in devising recipes directed to students (which makes good sense to school boards and the public, and they control funding). Of the recent palliatives for fragmented attention, that of Georgi Lozanov[13] is best known. The Lozanov method utilizes the metrical pattern of adagio movements (approximately one Hertz) in Baroque music to induce bodily relaxation while maintaining mental alertness. The effectiveness of Lozanov's method is clearly dependent upon the teacher's skill, and the careful attention to rhythm, intonation, drama, appropriate suggestions, rapport, etc. required would strain the talents of most professional actors.

The Lozanov method, Sophrology, the Tomatis method, Optima learning, Superlearning, and numerous other methods which have appeared in the past two decades have merit. One of the reasons they have not gained greater currency is that they require a special sort of teacher - not simply a teacher who has been *trained* to perform prescribed actions, but one who either already possesses the gift of intellectual honesty or has the courage and humility to acquire that rare gift. We lack the large number of teachers with that gift which would be necessary to transform the consciousness of great masses of students. Something must be done. The future of humanity is at stake.

Good teaching educes learners from their confining trance into a broader and more profound reality. Most of what takes place in our schools is not teaching at all, but instruction[14]. The distinction is vital, though seldom drawn. Instruction acquaints the learner with details of the Cave (trance state), whereas teaching shows the way out of the Cave; instruction trains the subject to perform, whereas teaching educates, freeing us from the tyranny of the performance principle. That this distinction has been muddied beyond recognition in recent times is evidence of the extent of our infatuation with the mundane and the consequent bankruptcy of education. Training enjoys great prosperity in our society. A society of highly trained people is easy prey for a Hitler, as great thinkers since Plato have pointed out:

> If, in the troubled times which may be before us, you wish appreciably to increase the chance of some savage upheaval, introduce widespread technical (training) and ignore the (intellectual and moral) ideal . . . Geometry and poetry are as essential as turning lathes.[15]

But have no fear, we have avoided that danger by the simple expedient of calling the training done by governments of which we approve "education" and the training done by our enemies "brain-washing"!

III. Resonance: The Generic Palliative

Not only do we live in a sea of vibrations, we are vibrations. As a physical being each of us is an incredibly complex pattern of rhythms (iterations, frequencies, vibrations, oscillations)[16], distinguished from the even more complex patterns of vibrations we call "the universe" by conventions of attention. For eons man has appreciated the importance of controlling attention, and has devised techniques to that end. According to biologists, man did not originate the idea of directing attention -- it is a "natural" phenomenon, as we can easily see in the mating behavior of animals, symbiosis, phototropism, etc. But there is general agreement that humans have done far more than any other organism to exploit the possibilities of attention control, both for good and for evil ends.

When humans began to make deliberate use of iterated motions, sights, sounds, and touches to capture the attention of others probably will never be known. A significant part of the problem hinges upon the issue of how we are to construe "deliberate": Human mothers have probably rocked their babies to sleep since the dawn of *homo sapiens*, but is this deliberate or instinctive behavior? Fortunately, for the purposes of this essay, the issue can remain moot. It is sufficient to

note that at least for the extent of recorded history humans have used all manner of rhythms to direct attention, and the neurophysiological basis for this is the phenomenon of psychophysical entrainment.

"Entrainment" is simply an active term for resonance, but since some people allow their emotions to overwhelm their intellect at the slightest suggestion of control, "resonance" is the prudent term to use. It is common knowledge that radio and television receivers are electromechanical devices which can be "tuned" to resonate with specific frequencies of the electromagnetic spectrum. A typical radio receiver has a range of frequencies to which it can resonate, and the user makes adjustments to the receiver to select the desired resonant frequency. But electronic devices are not the only things that resonate. The reason we can hear a conversation emanating from the adjoining room in a cheap hotel is that the wall resonates to our neighbors' voices, then our ear drums resonate to the vibrations of the wall. We are bombarded constantly with countless frequencies, the vast majority of which must be "tuned out" to prevent severe sensory overload. Early in life we become very adept at selecting only those frequencies which we believe to be important to us, while tuning out all others. Although this selective awareness has numerous obvious advantages, it is a double-edged sword. By diligently adhering to the range of awareness certified by our society as "safe", "proper", "sane", etc., we lock ourselves into a fixed reality-structure, thereby eliminating self-initiated growth. Then the only growth available to us is of the coercive variety (that is, it must come as an external force too powerful for us to tune out) -- beyond our control.

A recently popularized example of resonance among animals is known as "The Hundredth Monkey". The eminent biologist, Lyall Watson, relates the story:

> Off the coast of Japan are a number of tiny islands where resident populations of macaques have been under continuous observation for more than twenty years. The scientists provide supplementary food, but the monkeys also feed themselves by digging up sweet potatoes and eating them dirt and all. This uncomfortable practice continued unchanged for many years until one day a young male monkey broke with tradition and carried his potato down to the sea where he washed it before eating it. He taught the trick to his mother, who showed it to her current mate and so the culture spread through the colony until most of them, let us say 99 monkeys, were doing it. Then one Tuesday morning at eleven, the hundredth individual acquired the habit and, within an hour, it appeared on two other islands in two physically unconnected populations of monkeys who until that moment had shown no inclination to wash their food.[17]

An elaborate and carefully supported extrapolation of this phenomenon has been put forth by plant physiologist and biochemist Rupert Sheldrake[18], who calls it "morphic resonance". Grossly over-simplified, Sheldrake's hypothesis is that a pattern of behavior (whether at the molecular level or the macroscopic level) creates a field to which anything appropriately tuned will resonate, and the strength of this field is partially a function of the number of instances of that pattern, thus as more and more people (for example) perform a certain action, the pattern of that action exerts ever-greater "pressure" upon others to adopt it.

It should be obvious to anyone with even a fragmentary knowledge of history that Sheldrake's hypothesis has much confirming evidence in the area of human affairs. The commonplace way of putting it is that humans are slaves to fashion; social animals are constantly under pressure to "go along with the crowd". This human proclivity can be exploited for good and for evil, so we must be careful to avoid adoption of a cavalier attitude either for or against it. We are pleased to see honesty in adults engender honesty in children; we are displeased to see the operation of the same principle with regard to violence. The *principle* is value-free; values arise in connection with the *use* to which we put it.[19]

A little thought will reveal that the aspect of Sheldrake's hypothesis presented above (there are other, less conventional, aspects of it) is a generalized version of the pedagogical principle of emulation. We normally think of emulation in gross terms: teenagers aping the behavior of a folk hero; people adopting the style of dress dictated by some "fashion leaders"; public barbarization of the language by copying the speech of popular radio and television announcers. Wheldrake draws our attention to the fact that there are much subtler forms of emulation, that emulation takes place below as well as above the limen of conscious awareness, at the cellular and molecular level as well as at the macroscopic level.

Psychophysical entrainment is the human nervous system's emulation of (resonance with) a pattern. The primary human modes of access to patterns are sight and sound. Due to the relative ease with which we can manipulate sound, we have expended more effort on the control of consciousness by aural entrainment than through any other sensory medium. All of the world's music and the elaborate inflections of the human voice are examples of our ceaseless efforts to control consciousness by means of sound patterns. Humanity's success in this venture hardly needs touting. Viewing the thousands of years of successful employment of aural entrainment causes one to wonder why Western educational practices no longer emphasize it. Pedagogy in other parts of the world continues to appreciate its efficacy, and Westerners would do well to re-evaluate their stand.

IV. Applications of the Generic Palliative

In May of 1975, the United States Patent Office granted Robert A. Monroe patent number 3,884,218 for an application of psychophysical entrainment via sound patterns. Through the Monroe Institute of Applied Sciences, of which he is founder and director, Robert Monroe has conducted extensive experimentation with sound and light patterns in an attempt to determine notably the optimum frequencies, amplitudes, and patterns, but also the most promising areas of application. Although education is an obvious area for utilization, numerous constraints dictated that the majority of the institute's efforts be directed to the areas of personal growth and therapy.

The development of pedagogical applications for the type of aural resonance investigated by the Monroe Institute has been an abiding concern for the author of this paper since 1978. I have employed it for five years with college students in four major areas:

1. enhancement of cognitive learning;
2. enhancement of mental imagery;

3. promoting creativity;
4. allaying anxiety.

All of these uses depend upon focusing attention, which is accomplished by providing auditory stimuli at frequencies which induce the brain into an appropriate state while simultaneously synchronizing the hemispheres (whence the term "Hemi-Sync") to eliminate hemispheric rivalry. By "appropriate state" I mean that state best suited to the intended activity: the brain-state most conducive to cognitive learning differs from the state most conducive to creativity, for example.

My colleagues and I have used this method at Tacoma Community College in a variety of courses, including Introduction to Philosophy, Ethics, Philosophy of Religion, Death and Dying, Interpersonal Speech, Alternate States of Consciousness, Introduction to Psychology, Drawing (art), Creative Writing, Spanish, and The Art of Being Human. For those courses utilizing cognitive learning enhancement tapes assessment of effectiveness is relatively simple, although time-consuming. There has been time to perform only one carefully-controlled assessment. It was accomplished during Spring Quarter 1981, using two sections of Introduction to Psychology, both sections taught by the same person. There were twenty-four students in the experimental group and twenty-four in the control group. Composition of the groups was determined by use of the last digit of the students' Social Security numbers. At no time did any student have access to the scripts for the tapes, nor were the tapes "loaded" for the tests. Below is an analysis of the resulting data:

TEST	EXP. MEAN (tapes)	CONT. MEAN (no tapes)	EXP. STD. DEV.	CONTROL STD. DEV.	T TEST	SIGNIFICANT LEVEL @ .05
1	79.44	73.07	14.45	14.73	1.5564	Not sig.
2	76.71	65.92	12.37	15.11	2.9207	> .05 *
3	80.38	70.84	12.26	12.53	2.7732	> .05 *
4	83.84	73.92	9.96	11.99	3.1809	> .05 *
5	72.00	58.91	14.62	14.68	3.0925	> .05 *
6	66.64	54.88	17.92	14.28	2.5655	> .05 *
Comb.	76.56	66.37	14.68	15.46	5.9160	.05 **

*Test 2 significant level above .01 *Test 5 significant level above .01
*Test 3 significant level above .02 *Test 6 significant level above .02
*Test 4 significant level above .01 **Overall significant level far above .001

Reports from teachers using the cognitive tapes for their classes are consistent with the controlled study result. I have yet to devise a method for testing efficacy in the areas of mental imagery enhancement, creativity, and anxiety reduction.

In this age of strict *quantitative* accountability we are tempted to elevate that which can be reduced to numbers to a position of preeminence and ignore the qualitative. From the point of view of many students who have utilized Hemi-Sync, the affective aspect of it is far more important than the cognitive. Of course the only evidence I can offer is anecdotal. Many of my

students volunteer (usually in private) information about how much better they feel after listening to a tape: "My whole day seems brighter."; "I feel good about myself and my studies."; "I get along better with people after listening to your tapes."; "For the first time in my life I really enjoy school."; "My mind seems to be clearer. 1 understand things better."; "When I came to school this morning I was so tired and nervous, but after listening to tape number three I felt like a new person, and the whole day has been just great.". Hearing such reports is so commonplace that I stopped recording them long ago. Perhaps the affective component is best summarized by a statement from the Dean of Instruction, who, after some hesitation, finally listened to a tape: I haven't felt so relaxed and good all over for many years. Even if those tapes didn't speed up learning at all, they are well worth all of your efforts for the way they make a person feel.".

Following the lead of Robert Monroe (and much other research that applies in a peripheral way) I concentrated all efforts on binaurally phased sound patterns until early 1983. Binaural phasing results from providing a signal to one ear and a different signal to the other ear. For example, if the left ear is subjected to 300 Hz. and the right ear to 305 Hz., the brain (in a person with normal hearing) will experience a 5 Hz. beat (the difference between the two administered frequencies). Binaural phasing is an extremely effective entrainment technique, but obviously requires that the subject listen with stereo headphones. Enabling large numbers of students to use the method requires rather elaborate and expensive equipment. Tacoma Community College has such equipment in a listening laboratory accommodating sixteen students at a time. Most schools lack such a facility, which has been the major obstacle preventing widespread use of the Hemi-Sync method.

In 1982 a Tacoma Public Schools teacher, JoDee Owens, became interested in my work. She wanted to use the method in her class, but even if there had been no problem about acquiring the equipment, the prospect of having thirty squirming six-year-olds tethered by headphone cords while trying to write and . . . was terrifying. JoDee wanted to try loudspeakers, but I assured her that the efficacy of the method was a function of binaural phasing, so speakers wouldn't work. Her persistence weakened my conviction, and by the spring of 1983 I capitulated, agreeing to try it. Initial results were promising, so we spent much time during the summer of 1983 preparing tapes for the new group of first-graders she would have in September. The effect on her pupils has been dramatic. Her principal (Emma Sneed), the pupils' parents, and other teachers are amazed. Bruce Arneklev, of the Tacoma Public Schools Research and Evaluation Division, summed up his impression as follows:

> (The process used by JoDee) results in a great deal of independence and cooperation on the part of her first grade class. Each of the 22 students I observed made their own choices from exercises she had neatly printed on chalkboards on two sides of the room. They completed words (spelling), sentences (grammar), and wrote stories on their own while she worked with small reading groups. Then they read their stories, gave one minute "talks" and answered questions which were raised by other members of the class. (FIRST GRADERS!)[20]

I am still convinced that delivering the sound patterns with loudspeakers is less effective than with headphones, but headphones are totally impractical in a classroom setting. Furthermore, speakers have some advantages beyond low cost and ease of use:

1.the teacher benefits from hearing the music-masked sound patterns; 2.use of Hemi-Sync does not encroach upon time needed for regular classroom activities -- it is simply a background for those activities; 3.the Hemi-Sync/music ambiance for normal classroom activities encourages cooperation, mutual trust, and social harmony.

V. Types of Attention

"Attention" is much in need of precise definition. Its use has spanned a range from the chronic conceptual cramp characterizing bigotry to the indiscriminate receptivity of the amorphous sycophant. Etymologically, "attention" derives from Latin "attendere", to stretch toward, which allows considerable latitude of specificity. But post-Renaissance developments in the Western world contrived to make detailed analysis the desired attentional mode, so that for most people today 'attention' is nearly synonymous with 'concentration'. The hemispheric specialization model of brain functioning, so popular in recent years, assigns this concentrative type of attention to the left hemisphere and casts the right hemisphere into the role of global awareness. Although there is little doubt that the hemispheric paradigm has been grossly oversimplified by popularizers, it can serve a useful function if we resist the temptation to treat it as gospel.

There are notable differences between the analytic, particulate , causal, linear, quantitative style of attending (left hemisphere) and the synoptic, Gestalt, holistic, simultaneous, qualitative, style (right hemisphere). Both ancient wisdom and modern research hold that the wrinkled brow, clenched teeth, tense muscles, high anxiety type of attention (identified with "type A" personalities) which dominates our society is an eliminative, conservative, no-change mode, thus inimical to education and conducive to psychopathologies. This "left hemisphere" type of attention seems essential to training, and potential members of a society certainly need to be trained to perform useful social functions. But members of a free society need to know more than the intricacies of their own narrow slots. A free society requires members who are aware of the larger picture, people with expansive consciousness enabling them to appreciate other points of view, to tolerate paradoxes, to entertain ideals, to dream.

Lester Fehmi and George Fritz propose 'narrow focus' and 'Open Focus' as terms for the two sorts of attention described above. They portray narrow focused attention as an exclusive, constrictive, obsessive-compulsive, hysteric, stressful style of attending. Open focused attention includes narrow focused attention within its (in principle) unlimited range, thereby relieving the individual of the strain of screening out all that fails to fit into the established restrictive schema of narrow focus. Mindful of the need for both types if we are to actualize our potential, they claim that people can learn to reap the benefits of narrow focus while engaging in Open Focus. The two styles of attention are not mutually exclusive.

> It needs to be emphasized that simultaneous access to Open Focus, while at the same time rendering order out of the chaos of sensation, facilitates healthful and

> productive attentional behavior. Release of a rigidly apprehended focus of attention is associated with higher amplitude of EEG activity, as exemplified by alpha waves, and by a greater phase agreement of synchrony between the activity occurring at all lobes. Open focused attention is also associated with effortlessness and softening of goal-oriented behavior. Concomitant with Open Focus are moments of greater unself-consciousness, feelings of release of energy ("aha" experiences), more creative thoughts and associations, a greater sense of unity or well-being, a lack of criticalness or judgmentalness, and a more general or integrated awareness of all of one's experience simultaneously.[21]

Fehmi and Fritz are therapists. They provide no direct evidence that Open Focus is as effective as narrow focus in learning algebra, for example. But it could well be that their terminology is an attempt to label a phenomenon well-known to all experienced and aware teachers: There is a kind of attention (whatever we may call it) which results in rote learning with little or no awareness of the significance of what has been learned ("going through the motions" learning); there is another kind of attention that enables the learner to connect what is being learned with an indefinite number of aspects of his/her reality. If this be their intention (as it probably is), then Open Focus should receive the enthusiastic endorsement of educators.

In any event, the hypothesis which I began testing in 1978 is this: Many people attempt to learn while in a state of consciousness characterized by extremely fragmented attention. Their attention flits from one thing to another in an uncontrolled manner, only occasionally impinging upon that which they wish to learn. Self-awareness of their plight only adds another distraction, and (in extreme cases) may result in such frustration that they give up entirely. It is to possible to learn to control one's attention (Buddhist meditation techniques, for example), but the classical methods are so demanding that few people have the motivation to pursue them. Therefore, an externally imposed non-demanding method which will relieve the learner of the state of fragmented attention and induce a state of focused attention should give him/her the first-hand experience of an optimal learning state, thereby providing the motivation to pursue attention control by whatever means s/he deems appropriate.

Admonishing the learner to "pay attention" works no better today than it did centuries ago, probably because the appeal attempts to bring about an attitude change (affective domain) by cognitive means, and there is much experimental evidence supporting the contention that affect and cognition belong to two partially independent psychophysiological systems.

> The dismal failure in achieving substantial attitude change through various forms of communication or persuasion is another indication that affect is fairly independent and often impervious to cognition.[22]

Attending is not a cognitive function. It may be construed as a precondition for cognition, but is closely allied with affect, for it is a matter of attitude. Although "no change, no learning," is the most universally accepted pedagogical axiom, most people in the present era take it to mean change in cognitive content, which, consistent with the "container theory" of learning, involves no change in state of consciousness. While people in our culture are extremely reluctant to give up

their normal state of consciousness for the sake of more effective learning, they actively pursue ways for altering their consciousness for the sake of self-indulgence. Among their "accepted" and "benign" methods are intoxication (by alcohol, sugar, caffeine, prescribed drugs, etc.), viewing dramatic productions, exposure to television, sexual arousal, reading, listening to politicians, engaging in sports, and *MUSIC*. Of all the consciousness altering techniques, listening to music is the least threatening, therefore it is the best means for approaching an understandably wary public.

Music comprises all of the elements needed for psychophysical entrainment, and much music is extremely effective at entraining the nervous system. However, to my knowledge no composer has developed music for the expressed purpose of facilitating cognitive learning. Music is always directed to influencing feelings, emotions, attitudes (the affective domain). Certain Hemi-Sync patterns induce the optimum state of consciousness for cognitive learning, but they impress many persons as clinical and boring. The obvious solution: mix music with Hemi-Sync sounds.

VI. Music Plus Hemi-Sync

But what-kind of music should be used?

The Byzantines distinguished between *pneumata* (spiritual sounds: the octave, fifth, and fourth) and *somata* (bodily sounds: thirds and seconds). The ancient Greeks believed that different musical modes induce specific affective states in listeners. The classical music of India has occasioned extremely subtle categorizations in terms of the moods and feeling-states it elicits.

There is near-universal agreement that music has profound effects upon human emotions, but until recently little systematic study of the relationships between musical styles and specific emotions had been attempted. In the last two decades the field of psychoacoustics was born and has passed through early infancy. Although leaders in this new discipline disagree sharply on numerous issues, a measure of consensus concerning the basic sound patterns and the emotions they elicit is beginning to appear. Manfred Clynes, perhaps the most notable pioneer in the field, has amassed sufficient experimental evidence to prompt the assertion that there are "dynamic forms which have innate meaning, forms that can act upon the nervous system not in arbitrary ways but like keys in a lock, activating thereby specific brain processes" which either are the physical manifestations of emotions or cause us to react with emotion. He has isolated dynamic forms which correlate highly with anger, hate, grief, love, sex, joy, and reverence.[23]

Without benefit of research findings, most of us are sufficiently sensitive to the dynamics of sound to judge the "Missa Solemnis" inappropriate for a teenagers' party. Few of us would play a John Phillip Sousa march to set the mood for a romantic evening. But when pressed to cite the qualities of music most likely to engender a specific emotion, we flounder. Musical taste varies greatly. But in spite of the perilous nature of such a venture, it seems necessary to offer some guidelines for selection of music to use with Hemi-Sync:

1. Avoid familiar music.
2. Avoid music with a distinct beat (it can interfere the Hemi-Sync pattern)
3. Avoid music with lyrics.

4. Avoid music that compels people to move.
5. Avoid music with large, sudden changes in amplitude.
6. Avoid music that demands the listener's attention.
7. Avoid music that shocks or irritates the listener.
8. Use music with sustained tones and subtle variations.
9. Use music that is mellifluous, i.e., avoid cacophony.
10. Use music that is systematically ambiguous, i.e., that allows the greatest possible range of interpretation.

Popular music, of whatever genre, violates the first guideline. Beethoven's Ninth Symphony violates one, three, and six. Punk Rock violates all ten. It is fairly easy to eliminate entire classes of music in this manner, but not so easy to select particular compositions that satisfy the criteria.

Below is a list of musical works which have been found to work well for the purposes indicated. The absence of "classical" compositions is due to the fact that such works are familiar to many people, and most others (especially the young) view them as dangerous to their self-image ("What if I should actually begin to *like* that kind of music?").

The classification follows what is rapidly becoming a standard in distinguishing among the many functions of consciousness: cognitive, affective, and transpersonal (see Galyean's *Mind Sight: Learning Through Imaging*[27]). Some of the compositions fit into two Categories, either because of stylistic variation from one part to another or because the music serves the two functions equally well.

Purpose Code:
A - affect (eliciting emotions, feelings)
C - cognitive (rational thought processes, data, causal relations)
T - transpersonal (intuitive, mystical, spiritual)

MICHAEL STEARNS
Morning Jewel - A, T
Ancient Leaves - A, T
Planetary Unfolding - T
Light Play - A, T
Lyra Sound Constellation - T

BRIAN ENO
Ambient I - C
Ambient II - A, C
Ambient III - A, T
Ambient IV - A, T

WILLIAM AURA
Aurasound I - C
Aurasound II - C

Heartspace - T
Lovely Day - C
Timeless - C

WALTER CARLOS
Sonic Seasonings - A, T

JEAN-MICHEL JARRE
Equinox - C
Magnetic Fields -C
Oxygene - C

GEORGIA KELLY
Seapeace - C
Tarashanti - C
The Sound of Spirit - C, A
Birds of Paradise - C

STEVE HALPERN
All of his compositions
(about 16) - A, C

KITARO
Ki - C
Oasis - C
Silk Road - C
Silver Cloud - C
Ken Tai/Astral Trip - A, C
Tao - C

CONSTANCE DEMBY
Skies Above Skies - A, T
Sunborne - A, T

EDGAR FROESE
Aqua - A

VANGELIS
China - C
Spiral - C
Ognacio - C
L'Apocalypse des Animeaux - C

JORDAN de la SIERRA
Gymnosphere - A, T

IASOS
Angelic Music - T
Crystal Love - T
Interdimensional Music - A, T
Throne Realms - T

PAUL HORN
Inside I and 11 - A, T

LAURA ALLEN
Reflections I & 11 - A, T

HENRY WOLFF and NANCY HENNINGS
Tibetan Bells I & 11 - A, T

ROBERT SCHRODER
Floating Music - C

DON SLEPIAN
The Sea of Bliss - A, T

GEOFFREY CHANDLER
Starscapes - A, T

CYRILLE VERDEAUX
Offrandes - C

SYLVAN GREY
Ice Flowers Melting - C

MALCOLM CECIL
Radiance - C

THIJS van LEER
Introspection II - C

CYRILLE VERDEAUX and BERNARD XOLOTL
Prophecy - C

GAIL LAUGHTON
Harps of the Ancient Temples - C

VII. Imagery

Coming from one of the few intellectuals to achieve the rank of folk-hero, Albert Einstein's statement "Imagination is more important than knowledge." may strike some as strange. Its strangeness is easily traced to the popular conviction that the universe and knowledge are rational, whereas imagination is irrational. This conviction was born in ancient Greece, passed through puberty during the Renaissance, and matured (as psychology's obstreperous post-adolescent, Behaviorism) during the first half of the present century.

Now that the scourge of Behaviorism is behind us, we can once again turn to the infinite resources of imagination for succor. The use of imagery in nearly all types of therapy is increasing exponentially.[24] Learning, whether in a therapeutic or academic setting, depends in large part upon the recreation of experience, that is, we learn something new (have a new experience) only by using prior experiences as building-blocks, thus the ability to recreate experiences that we have had is vital to learning. There seem to be only three ways to recreate experience:

1. by contriving every detail of the original experience;
2. by reducing the original experience to a language (conventional signs);
3. by imagining the original experience.

The first method would be impractical even if it were not logically impossible; the second provides only a pale shadow of the original, for languages function by abstracting from experience (a child will never experience the taste of a tomato by means of a description); the third, however, recreates the original experience to the extent that one's imaging ability is not attenuated by conditioning. An imagined experience is available as a totality to all of the senses. All facets of the experience are present at the same time, enabling the subject to be aware of the multitude of complex relationships which comprise the totality without the laborious sequential processing of language-mediated awareness.[25]

> Not only does imagery allow for the guided or spontaneous creation of experience, it also facilitates vivid storage and recall of significant events. When the patient has a mental image available for repeated reference, he/she speculates less, concentrates better, and is more likely to maintain an intense affective response. The visual experience is simultaneous, like the real experience, and mental images elicit a depth of emotion with greater ease than does a verbally censored recital of affect.[26]

Pedagogy's fifty-year love affair with Behaviorism has left it diseased and nearly impotent. Many offspring from this union can still be heard intoning the litany: If you can't express it, then you don't know it. The silliness of this "great truth" can be appreciated by considering an extreme case: A knowledgeable person becomes totally paralyzed, thus she is unable to express anything. Does it follow that she knows nothing?

The study of pedagogical uses of imagery is currently enjoying a revival. Of the numerous researchers who have made notable contributions, probably none surpasses that of Beverly-Colleene Galyean. Her various journal articles and book, *Mind Sight: Learning Through*

Imaging[27], contain a wealth of insight and practical advice for the use of imagery in the classroom. Anyone wishing to use imagery for learning should study her work with care.

VIII. Classroom Use of Hemi-Sync

The fundamental use of Hemi-Sync in the classroom is attention-focusing. This can be accomplished with or without masking music, but experience has shown that carefully-chosen music enhances the effect. Whether used with music or alone, the Hemi-Sync sounds should be barely audible -- definitely not loud enough to interfere with communication.

There is little point in focusing attention unless it is to be put to work. It can be put to work on traditional classroom tasks, and the teacher will see a subtle but definite shift in students' attitudes (hence performance). For those adventuresome teachers who wish to create a more dramatic transformation, imagery combined with Hemi-Sync will make learning exciting and rewarding for everyone involved.

The optimum use of Hemi-Sync requires that its pattern be tailored to the intended use. Studying arithmetic requires a Hemi-Sync pattern which differs from the ideal pattern for studying literature. Selection of the best pattern for different classroom activities requires not only knowledge of the effects of Hemi-Sync, but also an analysis of the individual teacher's style, thus is best done on an individual basis. Attempting to set forth all of the considerations in this essay would result in some unfortunate interpretations.

The electronic equipment needed consists of a Hemi-Sync synthesizer[28], a pair of good speakers, and a music source. The synthesizer generates and mixes the necessary sounds, allows mixing of music with those sounds, and amplifies the resulting signal for delivery to speakers. A tape deck or phonograph (with preamplifier) is used to feed music to the synthesizer.

References and Notes

1. James, William, *The Principles of Psychology*, New York: Holt, 1890.
2. For some examples, see the 800+ articles and books cited in the bibliography of Norman Dixon's *Preconscious Processing*, New York: John Wiley and Sons, 1981.
3. Should the reader believe that there is a bit of paranoia behind this statement, read Felix Morrow, "William James and John Dewey on Consciousness: Suppressed Writings", *Journal of Humanistic Psychology*, vol. 24, no. 1, 1984, pp. 69-79. Morrow carefully documents his allegation that writings of both James and Dewey espousing unfashionable views of consciousness were deliberately kept from publication by people who felt threatened.
4. O'Regan, Brendan, institute of Noetic Sciences Newsletter, Spring 1982.
5. Maslow, Abraham, *The Farther Reaches of Human Nature*, New York: Penguin, 1976.
6. Deikman, Arthur, *The Observing Self*, Boston: Free Press, 1982, p. 129.
7. It is illuminating to note that 'trauma' is a Greek word meaning wound, and that in German "Traum" means dream. "Stopping the world" is don Juan's expression for the trauma that wakens us from the Traum of consensus reality. See Carlos Castaneda, *A Separate Reality*.

8. For a lucid account of the problems humans encounter in attempting to conceive of other realities, see Alex Comfort, *Reality and Empathy*, Albany: State University of New York Press, 1984.
9. Walsh, Roger, "The Consciousness Disciplines", *Journal of Humanistic Psychology*, vol. 23, no. 2, Spring 1983, p. 28.
10. See Marilyn Ferguson, *The Aquarian Conspiracy*, Los Angeles: J. P. Tarcher, 1980, and Stanley Krippner, "Some Implications of Consciousness Research for Education", unpublished paper, 1983.
11. I should like to deem it unnecessary to enter a caveat here, relying instead upon the good sense of the reader, but prudence dictates that since one never knows what sort of people might read one's output, a disclaimer is in order. The public falls prey to sensationalistic uses of expressions such as "altered states of consciousness" to the extent that mere mention of the expression calls up ghoulish associations. Instead of giving thought to what they encounter, many people seem to prefer the "knee-jerk" reaction. Of the thousands of examples which could be adduced, a particularly silly one from the Watergate era will serve to illustrate my point. The news media, in reporting events surrounding the President's audio tapes, chose (quite appropriately) the term 'expletive' to refer to emphatic (though unnecessary) expressions used on the tapes. Since the words so used on these tapes happened to be swear-words, and since the public was unfamiliar with "expletive", the vast majority of people came to believe that 'expletive' means swear-word. That we allow such active ignorance to determine the vocabulary we use contributes mightily to the poverty of our language, consequently to imprecision and obfuscation of thought processes. Failure to see that being in love, being intoxicated, being depressed, being angry, being ecstatic, etc., involve altered states of consciousness obscures similarities which can be profoundly important. Schooling which does not alter students' consciousness is a total failure -- and that includes parochial schooling.
12. There are many versions of the tale, all of which convey the same message: Nasrudin came upon a drunken man crawling around beneath a street light. Asked what he sought, the drunken man replied "My house-key!". "Where did you lose it?" asked Nasrudin. "In my house." came the reply. "They why search for it here?" "Because the light is better here." See Idris Shah, *The Exploits of the Incomparable Mulla Nasrudin*, New York: E. P. Dutton, 1972.
13. Lozanov, Georgi, *Suggestology and Outlines of Suggestopedy*, New York: Gordon and Breach, 1978.
14. "Instruction" derives from Latin "instruere", to pile upon. "Teach"' derives from the Anglo-Saxon root "tacn", which meant sign or symbol, hence to show, to demonstrate. Thus instruction is appropriate to training, where facts and truths are "piled upon" the learner to ensure desired performance. Teaching shows the learner a way out of his/her state of ignorance, hence is an educative ("education" comes from Latin "educare", to lead out) process. In her *The Life of the Mind*, Hannah Arendt elucidates this issue by distinguishing between ratiocination, which is goal-oriented, and pure thinking, which is the quest for meaning (see especially vol. 1, p. 15). That goal-directed reasoning is a mechanical activity devoid of meaning, thus inherently demeaning to an organism aspiring to transcend its material limitations, is a theme found in the writings of philosophers and theologians down through the ages.

15. Whitehead, Alfred North, *The Aims of Education*, New York: Macmillan, 1929.
16. Of the great number of philosophers, physicists, transpersonal psychologists, and neurophysiologists who support this view, the two who are most influential are David Bohm (see particularly his *Wholeness and the Implicate Order*, London: Routledge and Kegan Paul, 1980) and Karl Pribram (*Languages of the Brain*, Monterey, California: Brookes/Cole, 1971). For a sensitive account written in lay language, see Robert Lawlor, "The Resounding Cosmos and the Myth of Desire", *Parabola*, vol. 5, no. 2, 1980, pp. 78-85.
17. Lyall Watson, author of the Preface to Lawrence Blair's *Rhythms of Vision*, New York: Schocken Books, 1976.
18. Sheldrake, Rupert, *A New Science of Life: The Hypothesis of Formative Causation*, Los Angeles-; J. P. Tarcher, 1981.
19. It is alarming that this point escapes so many people. A particularly blatant example is the categorical rejection of hypnosis by a number of religious groups on the grounds that hypnosis can be used to promote attitudes of which they disapprove, while any disinterested observer acquainted with hypnotic techniques can see that the objecting groups make extensive use of hypnosis! And many of them watch television, without a doubt the most effective hypnotic device yet invented.
20. Inter-office memorandum from Dr. Bruce Arneklev, Research and Evaluation, to Dr. Richard Manion, Assistant Superintendent for Curriculum and Instruction, dated 14 February 1984.
21. Fehmi, Lester G. and Fritz, George, "Open Focus: The Attentional Foundation of Health and Well-Being", *Somatics*, Spring 1980, p. 25.
22. Zajonc, R. B., "Feeling and Thinking: Preferences Need No Inferences, *American Psychologist*, 35, 1980, p. 176.
23. Clynes, Manfred, and Nettheim, N., "The Living Quality of Music; Neurobiologic Patterns of Communicating Feeling", in Clynes, M., *Music, Mind, and Brain*, New York: Plenum, 1980, pp. 47-82.
24. Sheikh, Anees (ed.), *Imagination and Healing*, Farmingdale, New York: Baywood Publishing, 1984.
25. Nikola Tesla, the great engineer/inventor, could design a complex machine in his imagination, set it into operation, allow it to run for weeks or months, then disassemble it to check for wear. Only after he had corrected any flaws in this manner did he describe it to his draftsmen, who then drew plans so that the machine could be built.
26. Habeck, Beverly K., and Sheikh, Anees A., "Imagery and the Treatment of Phobic Disorders", in Sheikh, A. (ed.), *Imagination and Healing*, Farmingdale, New York, Baywood Publishing, 1984, p. 176.
27. Galyean, Beverly-Colleene, *Mind Sight: Learning Through Imaging*, Center for Integrative Learning, 767 Gladys Avenue, Long Beach, California 90804, 1983. Calyean's book is primarily a how-to-do manual. For more scholarly treatments see Anees Sheikh (note 24, above), which has bibliographies listing hundreds of books and journal articles on various facets of imagery.
28. The Hemi-Sync synthesizer is manufactured by AWI Electronics, 7620 29th West, Tacoma, Washington 98466.